PRODUCT CATALOG

COMPONENTS

FOR THE FOOD PROCESSING AND PHARMACEUTICAL INDUSTRIES

SMART IN FLOW CONTROL

Components for the Food Processing and Pharmaceutical Industries

Catalog 2023

Overview

Contents

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Specifications subject to change without notice

The data published in this catalog were up to date at the time of printing (September 2023). The latest version and up-to-date information on the entire SAMSON product range can be found on our website (www.samsongroup.com).

Overview

The SAMSON product range includes valves designed for the food processing and pharmaceutical industries as well as for the energy supply of production plants. The valves are manufactured in all common materials and comply with DIN and ANSI standards.

To ensure that valves are positioned exactly according to the control signal, positioners with an electric signal input or connected to common bus networks are used. Valves can be upgraded with accessories, such as limit switches or position transmitters.

This catalog provides you with an overview of SAMSON's product range designed for this specialized field. It contains background information on the special features of these valves and an extensive glossary to explain terms and abbreviations frequently used in the food processing and pharmaceutical industries.

The selection tables and tables listing the technical data include references to data sheets and other documentation, which provide detailed information on the products.

Food processing plant

Pharmaceutical plant

Application

Utility networks

V2001 (Type 3321 or Type 3323) and Type 3241 Valves control the supply of air, water, steam or refrigerants (utility networks) in production plants. The valves can be used with either pneumatic or electric actuators. The Type 3321CT Globe Valve is a compact stainless steel valve specially designed to meet the requirements of the food processing and pharmaceutical industries. The Type 3241 Globe Valve, Type 3310 Segmented Ball Valve and Type 3321CT Globe Valve are available with gaskets and packings that comply with the EU Regulation (EC) No. 1935/2004 and the US Regulation FDA 21 CFR Section 177.1550.

Hygienic valves for food processing

SAMSON has a range of valves designed to meet the specific requirements of the food processing industry. This range includes the Type 3347 Hygienic Angle Valve (see T 8097 and T 8097-1) and the Type 3349 Aseptic Angle Valve (see T 8048-2). The valves can be delivered with common end connections, such as flanges, hygienic couplings, Tri-Clamp® connections and welding ends.

Materials and design are certified to comply with regulations stipulated by FDA, EHEDG, 3-A etc.

Aseptic valves for the pharmaceutical industry

SAMSON's Type 3349 Aseptic Angle Valve as well as SAMSON SED diaphragm valves were developed specifically for aseptic applications in the food processing and pharmaceutical industries.

To meet with the stringent FDA and EHEDG requirements, the valve bodies are made of stainless steel and wetted surfaces are precision-lathed or polished. The valve bodies with minimized dead spaces are designed for CIP (cleaning-in place) or SIP (sterilization-in-place). The valves are self-draining when installed correctly.

A EPDM or PTFE diaphragm is used to shut off the valve towards the actuator and the atmosphere. Other diaphragm materials are available on request

As with the hygienic valves, these valves come with end connections designed as detachable or permanent fittings.

Self-operated pressure regulators

The Type 2371 Pressure Regulators are used in the food processing and pharmaceutical industries as excess pressure or pressure reducing valves.

The cavity-free bodies of the regulators are made of stainless steel. Wetted surfaces are either precision-lathed or polished.

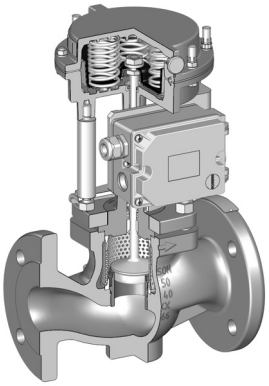
The set point can be adjusted mechanically or pneumatically.

The stem of the regulator can be locked in place to keep the plug open for the CIP or SIP process.

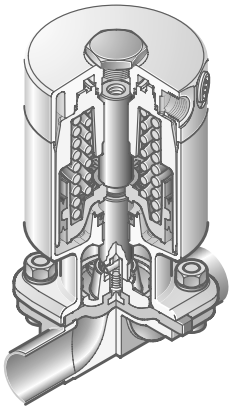
Modular systems

In addition to valves, there is a wide range of standardized solutions available for steam conditioning, condensate systems and on-site electric steam generation.

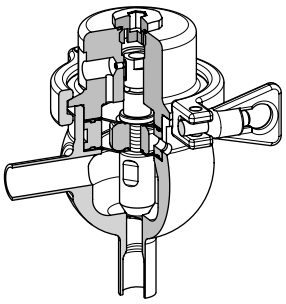
These system solutions provide a high level of functional safety, ensure high plant availability and allow highly precise temperature control (especially for processes heated with steam).



Series V2001 globe valve



SED Steripur 417 Aseptic Diaphragm Valve



Type 2371-00 Pressure Regulator with pneumatic set point adjustment

Valve Features

Valve body

The valves are available in all common and specified materials. While valves intended for controlling the supply of water or steam in plants have bodies made of cast iron or cast steel, hygienic and aseptic valves are manufactured in stainless steel to meet stringent requirements. These valves have bodies made from investment castings, forged steel or bar stock to meet specific requirements.

Surface finishes

In hygienic and, in particular, aseptic applications, the valves must be cleaned or sterilized to meet CIP or SIP requirements. The valves' surface finish must be designed to prevent the process medium from sticking to the inside of the valve and to minimize external contamination. The valve surface can be machined to achieve a surface roughness down to Ra 0.25 µm. The standard roughness is <Ra 0.8 µm.

- **Machining**
  The required quality of the surface finish is achieved by machining or manually polishing the surfaces. Favored methods include glass bead blasting, precision lathing or grinding with various grain sizes.
- **Electropolishing**
  The mechanically polished valve body (e.g. with 400-grit abrasives) is immersed in an electrolyte bath and a DC power supply is applied. The electrochemical process performed according to a standardized procedure removes the peaks from the roughness profile by at least 20 µm.
  The valve body acquires a shiny finish and is less sensitive to medium deposits. Common terms for electropolished surfaces include satin finish and mirror finish.

Plugs and throttling elements

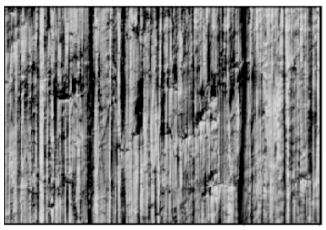
- **Parabolic plug**
  Parabolic plugs are easy to manufacture and can be easily cleaned. Plugs have a tendency to vibrate as the plug stem is only guided on one side. This type of plug is best suited for on/off applications and used at low pressure drops.
- **V-port plug**
  This special plug design is fairly complicated to manufacture and requires more care during cleaning. It is guided in the seat to prevent vibration. The V-port plug is suitable for high pressure drops.
- **Diaphragm**
  The use of a diaphragm as a throttling element ensures that the process medium does not come into contact with the actuator and cannot escape to the atmosphere. Tested and approved materials, such as EPDM and PTFE, and the specially designed bodies of SAMSON's Type 3349 Valves as well as SAMSON SED's diaphragm valves guarantee aseptic service.

Seat leakage

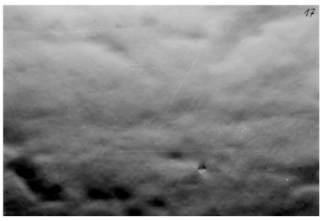
The valves are tested according to the standardized procedures and their measured seat leakage is graded in leakage classes.

IEC 60534-4 applies to DIN valves and ANSI/FCI 70-2 to ANSI valves.

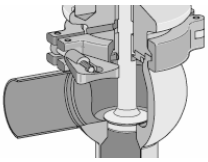
SAMSON SED's diaphragm valves used as shut-off valves have zero seat leakage. The seat leakage of these valves is tested in accordance with DIN EN 12266-1.



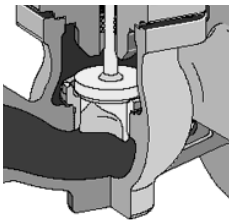
Polished body surface



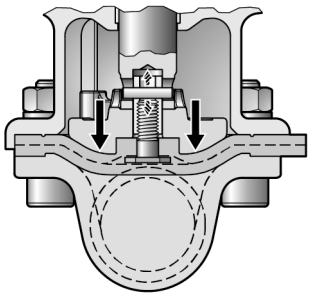
Electropolished body surface finish



Parabolic plug



V-port plug



One-piece fabric-reinforced diaphragm

End connections

The end connections to connect the valves to the pipeline are available with detachable or permanent welding ends. Detachable end connections are available as flanges, screw fittings or clamp connections.

The end connections can be supplied to meet all common pipe standards (ISO, DIN, ASME BPE, ASTM, BS, SMS, JIS). The inside diameters of the mating ends must be identical to ensure a flush transition between pipe and fitting as well as complete drainage.

– **Socket or butt weld ends**
  Welding ends provide safe and maintenance-free connections.
  Diverse pipe diameter and material thickness specifications exist for valves manufactured for the food processing and pharmaceutical industries due to the wide variety of existing standards. To meet hygienic or aseptic requirements, the ends of the butt weld fittings and the pipeline must be identical. Orbital welding is the most common method to weld on the ends without filler metals.

– **Flanges**
  Flanges in all DIN versions are used in plant engineering.
  Aseptic flanges according to DIN 11864-2 form A are sealed by partly open O-rings. This reduces dead cavities and improves cleanability. Grooved and mated flanges are bolted together and have a metal-to-metal stop to ensure that the O-ring is mounted with a defined compression. Both flanges are joined to the pipe ends by orbital welding. The weld seams are polished to meet the finish quality of the valve body.

– **Aseptic screwed pipe connections**
  The male part and liner are held together by a coupling nut.
  A gasket is used for sealing in hygienic couplings according to DIN 11851.
  Similar to the aseptic flanges, the aseptic screwed pipe connections are sealed by partly open O-rings. A metal-to-metal stop restricts the compression of the seal. The male part and liner are joined to the pipe ends by orbital welding and polished to meet the finish quality of the valve.

– **Clamp connection**
  The joints are held together by a cone-shaped clamp. An EPDM or PTFE gasket is inserted between the clamp fittings. The gasket compression varies depending on how far the wing nut is tightened.

Diaphragm valve body with welding ends

Diaphragm valve body with aseptic flanges

Hygienic angle valve with threaded ends

Detachable aseptic pipe connections and clamp

Selection Criteria

Overview

Valve	Type	3321CT	Series V2001: 3321/ 3323	3241	3351	3353/ 3354	3347	3349	Steripur	KMA	KMD	2371
Valve size	DN	15 to 80	15 to 100	15 to 300	15 to 100	15 to 80	6 to 125	6 to 100	4 to 100	4 to 100	8 to 100	15 to 50
	NPS	½ to 3	½ to 4	½ to 12	½ to 4	½ to 3	¼ to 5	¼ to 4	¼ to 4	¼ to 4	⅜ to 4	½ to 2
Pressure rating	PN [1]	16/40	16 to 40	10 to 40	16 to 40	16/40	16/40	10/25	10	10	10	10
	Class [2]	150/ 300	150/ 300	125 to 300	125 to 300	300	230/ 580	150/ 360	150	150	150	150
Application	Utility networks	•	•	•	•	•						
	Hygienic service						•					
	Aseptic service							•	•	•	•	•
Operating mode	Control	•	•	•			•	•				•
	On/off	•	•	•	•	•	•	•	•	•	•	
Valve type	Globe or Y-pattern valve body	•	•	•	•	•						
	Diaphragm valve							•	•	•	•	•
	Angle valve						•	•				•
	Three-way valve		•									
	Self-operated pressure regulators											•

[1] Maximum pressure in bar
[2] Maximum pressure in psi

Valve		Type	3321CT	Series V2001: 3321/ 3323	3241	3351	3353/ 3354	3347	3349	Steripur	KMA	KMD	2371
End connections	Flanges	All DIN versions			•								
		DIN EN 1092		•			•						
		DIN EN 1092-1	•			•		•					
		DIN EN 1092-2				•			•				•
		DIN EN 11853-2											
		DIN EN 11864-2						•	•	•	•	•	•
		ASME B16.1				•							
		ASME B16.5				•		•	•				•
	Welding ends	DIN EN 12627			•								
		DIN 11850					•	•	•	•	•	•	
		DIN 11866						•	•	•	•	•	•
		ASME BPE						•	•	•	•	•	
		ASME B16.25			•								
		ASTM 269								•	•	•	
		ASTM A-270											•
		ISO 1127						•	•	•	•	•	•
		ISO 2037					•	•	•				•
		ISO 4200					•						
		SMS 3008						•	•	•	•	•	•
		JIS G 3447						•	•	•	•	•	
		JIS G 3459						•	•	•	•	•	
		BS 4825						•	•	•	•	•	•
	Threaded ends	DIN 11851						•	•	•	•	•	•
		DIN 11864						•	•	•	•	•	•
		DIN 11887											•
		ISO 2853						•	•				•
		SMS 1146						•					•
		Other			NPT		G						
	Clamps	DIN 11864-3						•	•	•	•	•	•
		DIN 32676						•	•	•	•	•	•
		ASME BPE						•	•	•	•	•	•
		ISO 2852						•	•	•	•	•	•
		SMS 3008								•	•	•	
		SMS 3017								•	•	•	
		JIS G 3447						•	•				
		JIS G 3459						•	•				
		BS 4825						•	•				•
		NFE 2952							•				
	Special connections				•			•		•	•	•	•
Closure member		Parabolic plug	•	•	•	•	•	•	•				
		V-port plug			•			•	•				•
		Diaphragm							•				•
Cleaning		CIP						•	•	•	•	•	•
		SIP						•	•	•	•	•	•

Valve		Type	3321CT	Series V2001: 3321/ 3323	3241	3351	3353/ 3354	3347	3349	Steripur	KMA	KMD	2371
Body material	Cast iron	EN-GJL-250		•	•	•	•						
		A126B		•	•	•							
	Sph. gr. iron	EN-GJS-400-18-LT		•	•	•							
		A395											
	Cast steel	1.0619		•	•	•							
		1.6220/1.1138			•								
		A216 WCC		•	•	•							
		A352 LCC			•								
	Cast stainless steel	1.4308			•								
		1.4408	•	•	•	•	•						
		A351 CF8M	•	•	•	•							
		A351 CF8			•								
	Forged steel	1.0460			•								
		1.4401/1.4404			•			•					•
		1.4409						•					•
		1.4435						•	•	•	•	•	
		A105			•								
		A351 CF3M						•					
		CF3M											•
		A182 F316/ A182 F316L			•								
		A316L								•	•	•	
		316L						•	•				•
	Special materials							•	•	•	•	•	
Internal parts (seat/plug)		1.4006		•	•	•							
		1.4008			•								
		1.4104		•									
		1.4301			•								
		1.4305		•									
		1.4308			•								
		1.4401/1.4404	•	•	•	•	•	•					•
		1.4409			•								•
		1.4435							•				
		1.4571					•						
		Cr steel UNS S41000			•								
		A182 F6a Cl. 2				•							
		A182 F316/ A182 F316L	•		•								
		A182 F304			•								
		A479 316/ A479 316L		•									
		A351 CF3M			•								
		A351 CF8			•								
		CF3M		•									•
		F316/F316L		•									
		316/316L		•		•		•	•				•
		A582 430F		•									
		A276 410T		•									
Stem seal		Packing	•	•	•	•	•						
		Lip seal						•					
		Diaphragm							•	•	•	•	•

Valve		Type	3321CT	Series V2001: 3321/ 3323	3241	3351	3353/ 3354	3347	3349	Steripur	KMA	KMD	2371
Surface roughness Ra	Internal finish not specified		•	•	•	•	•						
	Mechanical polishing	≤1.9 µm											
		≤0.9 µm											
		≤0.8 µm								•	•	•	
		≤0.6 µm								•	•	•	
		≤0.4 µm						4)	4)	•	•	•	4)
		≤0.25 µm								• 3)	• 3)	• 3)	
	Electropolished	≤0.9 µm											
		≤0.8 µm								•	•	•	
		≤0.6 µm								•	•	•	
		≤0.4 µm								•	•	•	
		≤0.25 µm								• 3)	• 3)	• 3)	
Temperature range in	°C	Medium temp.	–10 to +220	–10 to +300	–196 to +450	–10 to +220	–10 to +180	–10 to +150	–10 to +160	Up to 160	Up to 160	Up to 150	0 to 160
	°F	Medium temp.	14 to 428	14 to 572	–320 to 842	14 to 428	14 to 356	14 to 302	14 to 320	Up to 320	Up to 320	Up to 302	32 to 320
Approvals for seals		Regulation (EC) No. 1935/2004	•			• 3)		•	•				•
		Regulation (EU) No. 10/2011						•	•				•
		Regulation (EC) No. 2023/2006						•	•				•
		FDA CFR #21 Section 177...	•			• 3)		•	•	•	•	•	•
		USP Class VI						•	•	•	•	•	•
		ADI free						•	•				•
		3-A						• 3)	•	•	•	•	
		EHEDG						• 3)	•				
Options		Pressure balancing			•								
		Flow divider		•	•								
		Metal bellows seal			•								
		Lining											
		Insulating section		•	•								
		Heating jacket			•								
		Additional manual override			•	•				•	•	•	
		Corrosion-resistant actuator	•		•	• 3)		•	•	•	•	•	•
		Electric actuator		•	•			•	•				
		RFID tag with unique identification acc. to DIN SPEC 91406			•								
Associated documentation		Data Sheet T	8115	8111/ 8112 8113/ 8114	8015/ 8012	8039	8139/ 8140	8097	8048-2/ 8048-21/ 8048-22	SED catalog			2640/ 2642

3) Option
4) See associated Data Sheet

Pneumatic Control Valves for Plant Engineering

Series V2001 and Series 240 Valves

Application

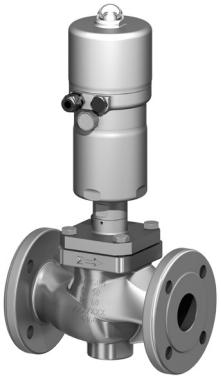
Control valves designed for mechanical and plant engineering. Suitable for liquids, gases and steam.

Versions

Pneumatic, electric or electropneumatic control valves in accordance with DIN or ANSI standards up to PN 40 (Class 300) for medium temperature range from –196 to +450 °C

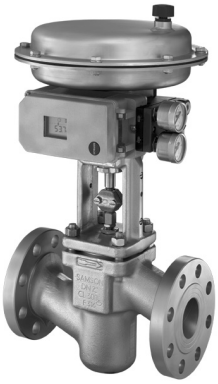
- **Type 3321CT** · Globe valve with Type 3379 Pneumatic Actuator and Type 3724 Positioner
- **Type 3321-IP/-PP/-E1/-E3** · Globe valve, DN 15 to 100 (NPS ½ to 4)
- **Type 3323-IP/-PP/-E1/-E3** · Three-way valve, DN 15 to 100 (NPS ½ to 4)
- **Type 3241-1** or **Type 3241-7** · Globe valve, DN 15 to 300 (NPS ½ to 12)

SAMSON valve		**Type 3321CT**	**Type 3321**	**Type 3323**	**Type 3241**
Valve size	DN	15 to 80	15 to 100	15 to 100	15 to 300
	NPS	½ to 3	½ to 4	½ to 4	½ to 12
Body material	Cast iron		•	•	•
	Spheroidal graphite iron		•	•	•
	Cast steel		•	•	•
	Stainless steel	•	•	•	•
	Forged steel				•
Pressure rating	PN	Up to 40			
	Class	150/300			125 to 300
End connections	Flanges	•	•	•	•
	Welding ends				•
	Threaded ends				•
Leakage class		Up to VI	Up to VI	0.05 % K_{VS}	Up to VI
Characteristic		Equal percentage	Inherent	Linear	Equal percentage or linear
Medium temperature		–10 to +220 °C	–10 to +300 °C		–196 to +450 °C
Actuator		Type 3379	Type 3371 Type 3372 Type 5824 Type 3374		Type 3271 Type 3277
Associated documentation		T 8115	T 8111/ T 8112	T 8113/ T 8114	T 8012 T 8015 T 8310-X



Series V2001: Type 3321CT Globe Valve with Type 3379 Pneumatic Actuator and Type 3724 Positioner

Series V2001: Type 3323 Three-way Valve with Type 3372 Pneumatic Actuator and Type 3725 Positioner



Series 240: Type 3241 Globe Valve

Pneumatic Control Valves for Plant Engineering

Type 3351 On/off Valve

Type 3353 Angle Seat Valve

Type 3354 Globe Valve

Application

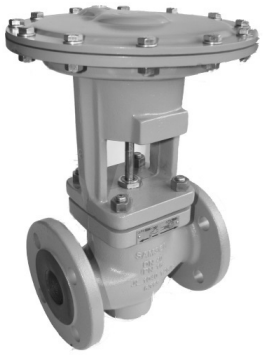
On/off valves designed for mechanical and plant engineering. Tight shut-off. Suitable for liquids, gases and steam.

Versions

Pneumatic control valves in accordance with DIN or ANSI standards

- **Type 3351** · On/off valve with pneumatic actuator
- **Type 3353** · Globe valve made of stainless steel with angle seat body, soft-seated flat plug and pneumatic piston actuator, optionally with limit switch and/or solenoid valve
- **Type 3354** · Globe valve with straight pattern body, soft-seated flat plug and pneumatic piston actuator, optionally with limit switch and/or solenoid valve

SAMSON valve		Type 3351	Type 3353	Type 3354
Valve size	DN	15 to 100	15 to 50 G ½ to G 2	15 to 80
	NPS	½ to 4	–	–
Body material	Cast iron	•		•
	Spheroidal graphite iron	•		
	Cast steel	•		
	Stainless steel	•	•	
Pressure rating	PN	Up to 40	40	16
	Class	Up to 300		
End connections	Flanges	•		•
	Welding ends		•	
	Female thread		•	
Leakage class		VI		
Characteristic		On/off		
Medium temperature		–10 to +220 °C	–10 to +180 °C	–10 to +180 °C
Ambient temperature		NBR: –35 to +100 °C EPDM: –40 to +150 °C FKM: –25 to +200 °C	–10 to +60 °C	–10 to +60 °C
Actuator		Integrated	30/60 cm²	30, 60, 120 cm²
Associated documentation		T 8039	T 8139	T 8140



Type 3351 On/off Valve

Type 3353 Angle Seat Valve

Type 3354 Globe Valve

Pneumatic Control Valves for Hygienic and Aseptic Applications

Type 3347 Hygienic Angle Valve

Application

Pneumatic control valves for the food processing and pharmaceutical industries. Optionally with Type 3271 or Type 3277 Pneumatic Actuators for integral attachment of positioners and accessories or with Type 3372 or Type 3379 Actuators.

Compliance

The Type 3347 Hygienic Valve complies with the following regulations and standards:

- FDA 21 CFR 177.1550, FDA 21 CFR 177.2600, FDA 21 CFR 177.2415
- NSF H1
- EC 1935/2004
- EU 10/2011
- EC 2023/2006
- Free of animal-derived ingredients (ADI-free)
- EC 999/2001, revision 2015: TSE/BSE free
- Versions complying with EHEDG and 3-A regulations on request

Versions

Control valves in accordance with DIN or ANSI standards

- **Type 3347** · Hygienic angle valve with Type 3271 or Type 3277 Actuator

SAMSON valve		**Type 3347**	
Body version		Cast	Bar stock
Valve size	DN	25 to 100	15 to 150
	NPS	1 to 4	½ to 6
Body material	1.4404/316L		•
	1.4409/CF3M	•	
	1.4435/316L		•
	Special materials		•
Bonnet	Bolted-on		Up to 63 bar/914 psi
	Clamp	•	Up to 16 bar/230 psi
Maximum pressure		16 bar/230 psi	16 bar/230 psi 63 bar/914 psi [1]
End connections	Flanges	•	•
	Welding ends	•	•
	Threaded ends	•	•
	Clamps	•	•
Leakage class		Up to VI	Up to VI
Characteristic		Equal percentage or linear	Equal percentage or linear
Steam barrier		•	•
Medium temperature range		–10 to 150 °C	–10 to 150 °C
Cleaning	CIP	•	•
	SIP	•	•
Actuator		Type 3271/Type 3277	
Associated documentation		T 8097	

[1] Maximum pressure depends on the valve end connections

Type 3347/3277 Pneumatic Control Valve (cast body) with Type 3725 Positioner

Type 3347/3379 Control Valve (cast body) with welding ends and Type 3724 Positioner

– **Type 3347** · Hygienic angle valve with Type 3372 Actuator and as micro-flow valve with Type 3271 or Type 3277 Actuator

SAMSON valve		**Type 3347**	
Body version		For Type 3372 Actuator	Micro-flow valve [1]
Valve size	DN	25 to 100	6 to 25
	NPS	1 to 4	¼ to 1
Body material	1.4404/316L		•
	1.4409/ A351 CF3M	Casting	
	1.4435/316L		•
	Special materials		•
Bonnet	Bolted-on		•
	Clamp	•	
Maximum pressure		14 bar/200 psi 16 bar/230 psi [2]	16 bar/230 psi
End connections	Flanges		•
	Welding ends	•	•
	Threaded ends		•
	Clamps		•
Leakage class		Up to IV	Up to IV
Characteristic		Equal percentage or linear	Equal percentage or linear
Medium temperature range		0 to +150 °C	–10 to +150 °C
Cleaning	CIP	•	•
	SIP	•	•
Actuator		Type 3372	Type 3271/Type 3277
Associated documentation		T 8097-1	T 8097

1) K_{VS} 0.01 to 0.25 · C_V 0.012 to 0.30
2) Maximum pressure depends on the medium temperatures

Type 3347/3372 Control Valve with Type 3725 Positioner

Type 3347/3379 Micro-flow Valve with Type 3724 Positioner

– **Type 3347** · Hygienic angle valve with Type 3379 Actuator

SAMSON valve		**Type 3347**		
Body version		Cast	Bar stock	Micro-flow valve
Valve size	DN	25 to 80 [2]	15 to 80 [2]	6 to 25
	NPS	1 to 3 [2]	½ to 3 [2]	¼ to 1
Body material	1.4404/316L		•	
	1.4409/CF3M	•		
	1.4435/316L		•	•
	Special materials	•	•	
Bonnet	Bolted-on		63 bar/914 psi	•
	Clamp	•	16 bar/230 psi	
Maximum pressure		16 bar/230 psi	16 bar/230 psi 63 bar/914 psi [1]	16 bar/230 psi
End connections	Flanges	•	•	•
	Welding ends	•	•	•
	Threaded ends	•	•	•
	Clamp	•	•	•
Leakage class		Up to VI	Up to VI	Up to IV
Characteristic		Equal percentage or linear	Equal percentage or linear	Equal percentage or linear
Steam barrier		•	•	
Medium temperature range		–10 to 150 °C	–10 to 150 °C	–10 to 150 °C
Cleaning	CIP	•	•	•
	SIP	•	•	•
Actuator		Type 3379		
Associated documentation		T 8097		

1) Maximum pressure depends on the valve end connections
2) Only for version with clamp in DN 65 to 80/NPS 2½ to 3

Compact automated unit: Type 3347 Angle Valve with Type 3379 Pneumatic Actuator and Type 3724 Positioner

Pneumatic Control Valves for Hygienic and Aseptic Applications

Type 3349 Aseptic Angle Valve

Application

Control valve for aseptic applications in the food and pharmaceutical industries according to DIN or ANSI standards with USP-VI diaphragm

Compliance

The Type 3349 Aseptic Valve complies with the following regulations and standards:

- FDA 21 CFR 177.1550, FDA 21 CFR 177.2600, FDA 21 CFR 177.2415
- NSF H1
- EC 1935/2004
- EU 10/2011
- EC 2023/2006
- Free of animal-derived ingredients (ADI-free)
- EC 999/2001, revision 2015: TSE/BSE free
- Versions complying with EHEDG and 3-A regulations on request

Versions

- **Type 3349** · Aseptic angle valve with Type 3271 or Type 3277 Pneumatic Actuator
- **Type 3349** · Aseptic angle valve with Type 3379 Pneumatic Actuator

SAMSON valve		**Type 3349**	
Hardware version		**HV01**	
Actuator		Type 3271/3277	Type 3379
Valve size (standard version)	DN	6 to 100	6 to 50
	NPS	¼ to 4	¼ to 2
Valve size (micro-flow valve)	DN	6 to 100	6 to 50
	NPS	¼ to 4	¼ to 2
Body material	1.4435/316L	•	•
	Special materials	•	•
Bonnet	Bolted-on	•	•
Maximum pressure	Standard version	25 bar/360 psi	25 bar/360 psi
	Micro-flow valve	10 bar/145 psi	10 bar/145 psi
End connections	Flanges	•	•
	Welding ends	•	•
	Threaded ends	•	•
	Clamps	•	•
Leakage class		Up to VI	Up to VI
Characteristic		Equal percentage or linear	Equal percentage or linear
Sterilization temperature		180 °C (356 °F) up to 30 min	180 °C (356 °F) up to 30 min
Operating temperature range		–10 to 160 °C (14 to 320 °F)	–10 to 160 °C (14 to 320 °F)
Cleaning	CIP	•	•
	SIP	•	•
Associated documentation		T 8048-2	T 8048-2

Compact automated unit: Type 3349 Angle Valve with Type 3379 Pneumatic Actuator and Type 3724 Positioner

Type 3349 Angle Valve with Type 3277 Pneumatic Actuator and Type 3730 Positioner

Pneumatic Diaphragm Valves for Aseptic Applications

SED Steripur Series Diaphragm Valves

Application

Pneumatic diaphragm valves with minimized dead spaces for aseptic applications in the food processing and pharmaceutical industries according to ASME BPE, DIN or ISO standards

Versions

- **Steripur 217** · Diaphragm valve with stainless steel double-piston actuator
- **Steripur 317, 407, 417** · Diaphragm valve with stainless steel piston actuator

Stainless steel piston actuator		**Steripur 217**	**Steripur 317**	**Steripur 417**	**Steripur 407**
Valve size	DN	4 to 15	8 to 20	15 to 65	65 to 100
	NPS	¼ to ½	⅜ to ¾	¾ to 2½	2½ to 4
Body material		Investment casting or forged steel 1.4435 · A316L [1]			
Max. operating pressure	EPDM diaphragm	8 bar		10 bar ≤DN 50 [2]	
	PTFE diaphragm	7 bar		8 bar ≤DN 50 [3]	
End connections		Welding ends · Clamps · Aseptic flanges · Special versions			
Characteristic		On/off			
Behavior		Quick opening · Self draining			
Diaphragm		MA 8	MA 10	MA 25 to 50	MA 80, 100
Diaphragm material	EPDM	Single-piece			
	PTFE/EPDM	Single-piece		Single-piece, two-piece	Two-piece
Max. medium temperature		160 °C			
Medium temperature range	EPDM, one-piece	–10 to +150 °C			
	PTFE/EPDM, one-piece	–10 to +150 °C (MA 50 and lower)			–
	PTFE/EPDM, two-piece	–		–10 to +160 °C	
Certificates	EPDM Code 28/20	FDA CFR #21 Section 177.2600 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class II			
	PTFE/EPDM Code 30/44	FDA CFR #21 Section 177.1550 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class I			
Actuator		Stainless steel piston actuator			
Associated documentation		SED catalog			

[1] Other materials, e.g. 1.4539/AISI 904L, on request
[2] DN 65 and 80: 7 bar; DN 100: 6 bar
[3] DN 65 and 80: 6 bar; DN 100: 5 bar

SED Steripur 217 Diaphragm Valve

SED Steripur 317 Diaphragm Valve

SED Steripur 417 Diaphragm Valve

SED Steripur 407 Diaphragm Valve

– **Steripur 206, 397, 907 997** · Diaphragm valve with stainless steel bonnet and hand-wheel

Stainless steel bonnet and hand-wheel		**Steripur 206**	**Steripur 397**	**Steripur 907**	**Steripur 997**
Valve size	DN	4 to 15	8 to 20	15 to 65	65 to 100
	NPS	¼ to ½	⅜ to ¾	¾ to 2½	2½ to 4
Body material		Investment casting or forged steel 1.4435 · A316L [1]			
Max. operating pressure	EPDM diaphragm	10 bar			
	PTFE diaphragm	10 bar		10 bar ≤DN 50 [2]	
End connections		Welding ends · Clamps · Aseptic flanges · Special versions			
Characteristic		On/off			
Behavior		Self draining			
Diaphragm		MA 8	MA 10	MA 25 to 50	MA 80 to 100
Diaphragm material	EPDM	Single-piece			
	PTFE/EPDM	Single-piece		Single-piece, two-piece	Two-piece
Max. medium temperature		160 °C			
Medium temperature range	EPDM, one-piece	–10 to +150 °C			
	PTFE/EPDM, one-piece	–10 to +150 °C			–
	PTFE/EPDM, two-piece	–		–10 to +160 °C	
Certificates	EPDM Code 28/20	FDA CFR #21 Section 177.2600 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class II			
	PTFE/EPDM Code 30/44	FDA CFR #21 Section 177.1550 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class I			
Actuator		Stainless steel bonnet and hand-operated actuator			
Associated documentation		SED catalog			

[1] Other materials, e.g. 1.4539/AISI 904L, on request
[2] DN 65 to 100: 8 bar

SED Steripur 206 Diaphragm Valve

SED Steripur 397 Diaphragm Valve

SED Steripur 907 Diaphragm Valve

SED Steripur 997 Diaphragm Valve

Pneumatic Diaphragm Valves for Aseptic Applications

SED KMA Series Diaphragm Valves

Application

Pneumatic diaphragm valves with minimized dead spaces for aseptic applications in the food processing and pharmaceutical industries according to ASME BPE, DIN or ISO standards

Versions

- **KMA 190, KMA 195, KMA 395** · Diaphragm valve with plastic piston actuator and stainless steel adapter
- **KMA 495** · Diaphragm valve with plastic diaphragm actuator and stainless steel adapter

Plastic actuator with stainless steel adapter		**KMA 190**	**KMA 195**	**KMA 395**	**KMA 495**
Valve size	DN	4 to 15	8 to 20	15 to 65	15 to 100
	NPS	¼ to ½	⅜ to ¾	¾ to 2½	¾ to 4
Body material		Investment casting or forged steel 1.4435 · A316L [1]			
Max. operating pressure	EPDM diaphragm	8 bar		10 bar ≤DN 50 [2]	
	PTFE diaphragm	7 bar		8 bar ≤DN 50 [3]	
End connections		Welding ends · Clamps · Aseptic flanges · Special versions			
Characteristic		On/off			
Behavior		Quick opening · Self draining			
Diaphragm		MA 8	MA 10	MA 25 to 50	MA 25 to 50, 80, 100
Diaphragm material	EPDM	Single-piece			
	PTFE/EPDM	Single-piece		Single-piece, two-piece	Two-piece
Max. medium temperature		160 °C			
Medium temperature range	EPDM, one-piece	–10 to +150 °C			
	PTFE/EPDM, one-piece	–10 to +150 °C (MA 50 and lower)			–
	PTFE/EPDM, two-piece	–		–10 to +160 °C	
Certificates	EPDM Code 28/20	FDA CFR #21 Section 177.2600 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class II			
	PTFE/EPDM Code 30/44	FDA CFR #21 Section 177.1550 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class I			
Actuator		Thermoplastic piston actuator with stainless steel adapter			Plastic diaphragm actuator with st. steel adapter
Associated documentation		SED catalog			

[1] Other materials, e.g. 1.4539/AISI 904L, on request
[2] DN 65 and 80: 7 bar; DN 100: 6 bar
[3] DN 65 and 80: 6 bar; DN 100: 5 bar

SED KMA 190 Diaphragm Valve

SED KMA 195 Diaphragm Valve

SED KMA 395 Diaphragm Valve

SED KMA 495 Diaphragm Valve

– **KMA 205, KMA 295, KMA 905, KMA 995** · Diaphragm valve with stainless steel bonnet and plastic handwheel

Stainless steel bonnet and plastic handwheel		**KMA 205**	**KMA 295**	**KMA 905**	**KMA 995**
Valve size	DN	4 to 15	8 to 20	15 to 65	65 to 100
	NPS	¼ to ½	⅜ to ¾	¾ to 2½	2½ to 4
Body material		Investment casting or forged steel 1.4435 · A316L [1]			
Max. operating pressure	EPDM diaphragm	10 bar			
	PTFE diaphragm	10 bar		10 bar ≤DN 50 [2]	
End connections		Welding ends · Clamps · Aseptic flanges · Special versions			
Characteristic		On/off			
Behavior		Self draining			
Diaphragm		MA 8	MA 10	MA 25 to 50	MA 80 to 100
Diaphragm material	EPDM	Single-piece			
	PTFE/EPDM	Single-piece		Single-piece, two-piece	Two-piece
Max. medium temperature		160 °C			
Medium temperature range	EPDM, one-piece	–10 to +150 °C			
	PTFE/EPDM, one-piece	–10 to +150 °C			–
	PTFE/EPDM, two-piece	–		–10 to +160 °C	
Certificates	EPDM Code 28/20	FDA CFR #21 Section 177.2600 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class II			
	PTFE/EPDM Code 30/44	FDA CFR #21 Section 177.1550 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class I			
Actuator		Stainless steel bonnet and thermoplastic hand-operated actuator			
Associated documentation		SED catalog			

1) Other materials, e.g. 1.4539/AISI 904L, on request
2) DN 65 and 100: 8 bar

SED KMA 205 Diaphragm Valve

SED KMA 295 Diaphragm Valve

SED KMA 905 Diaphragm Valve

SED KMA 995 Diaphragm Valve

Pneumatic Diaphragm Valves for Aseptic Applications

SED KMD Series Diaphragm Valves

Application

Pneumatic diaphragm valves with minimized dead spaces for aseptic applications in the food processing and pharmaceutical industries according to ASME BPE, DIN or ISO standards

Versions

- **KMD 188** · Diaphragm valve with plastic piston actuator directly mounted onto the valve body
- **KMD 402** · Diaphragm valve with plastic piston actuator
- **KMD 385** · Diaphragm valve with plastic diaphragm actuator directly mounted onto the valve body

Plastic actuator		**KMD 188**	**KMD 402**	**KMD 385**
Valve size	DN	8 to 20	15 to 65	15 to 80
	NPS	⅜ to ¾	¾ to 2½	¾ to 3
Body material		Investment casting or forged steel 1.4435 · A316L [1]		
Max. operating pressure	EPDM diaphragm	8 bar	10 bar	10 bar [2]
	PTFE diaphragm	7 bar	8 bar	8 bar [3]
End connections		Welding ends · Clamps · Aseptic flanges · Special versions		
Characteristic		On/off		
Behavior		Quick opening · Self draining		
Diaphragm		MA 10	MA 25 to 50	MA 25 to 50, 80
Diaphragm material	EPDM	Single-piece		
	PTFE/EPDM	Single-piece		
Max. medium temperature		PS version: 80 °C HS version: 150 °C	150 °C	Max. 80 °C
Medium temperature range	EPDM, one-piece	–10 to +150 °C		
	PTFE/EPDM, one-piece	–10 to +150 °C	–	
	PTFE/EPDM, two-piece	–	–10 to +160 °C	
Certificates	EPDM Code 28/20	FDA CFR #21 Section 177.2600 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class II		
	PTFE/EPDM Code 30/44	FDA CFR #21 Section 177.1550 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class I		
Actuator		Plastic piston actuator directly mounted onto the valve body	Plastic piston actuator directly mounted onto the valve body	Plastic diaphragm actuator directly mounted onto the valve body
Associated documentation		SED catalog		

[1] Other materials, e.g. 1.4539/AISI 904L, on request
[2] DN 65 and 80: 7 bar
[3] DN 65 and 80: 6 bar

SED KMD 188 Diaphragm Valve

SED KMD 402 Diaphragm Valve

SED KMD 385 Diaphragm Valve

– **KMD 289, KMD 982, KMD 985** · Diaphragm valve with plastic bonnet and handwheel

Plastic bonnet and handwheel		**KMD 289**	**KMD 982**	**KMD 985**
Valve size	DN	8 to 20	15 to 65	65 to 100
	NPS	⅜ to ¾	¾ to 2½	2½ to 4
Body material		Investment casting or forged steel 1.4435 · A316L [1]		
Max. operating pressure	EPDM diaphragm	6 bar	10 bar	10 bar
	PTFE diaphragm	6 bar	10 bar	8 bar
End connections		Welding ends · Clamps · Aseptic flanges · Special versions		
Characteristic		On/off		
Behavior		Quick opening · Self draining		
Diaphragm		MA 10	MA 25 to 50	MA 80 to 100
Diaphragm material	EPDM	Single-piece		
	PTFE/EPDM	Single-piece	Single-piece, two-piece	Two-piece
Max. medium temperature		S version: 80 °C HS version: 150 °C	80 °C	80 °C
Medium temperature range	EPDM, one-piece	–10 to +150 °C		
	PTFE/EPDM, one-piece	–10 to +150 °C		–
	PTFE/EPDM, two-piece	–		–10 to +160 °C
Certificates	EPDM Code 28/20	FDA CFR #21 Section 177.2600 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class II		
	PTFE/EPDM Code 30/44	FDA CFR #21 Section 177.1550 · USP Class VI Test Section #87 + 88, 3-A Sanitary Class I		
Actuator		Plastic bonnet and hand-operated actuator		
Associated documentation		SED catalog		

[1] Other materials, e.g. 1.4539/AISI 904L, on request

SED KMD 289 Diaphragm Valve

SED KMD 982 Diaphragm Valve

SED KMD 985 Diaphragm Valve

Self-operated Pressure Regulators for the Food Processing Industry

Type 2371-00 and Type 2371-01 Excess Pressure Valves

Type 2371-10 and Type 2371-11 Pressure Reducing Valves

Application

Pressure reducing valves or excess pressure valves for the food and pharmaceutical industries for liquids and gases

Compliance

The Type 2371 Pressure Regulators comply with the following regulations and standards:

– FDA 21 CFR 177.1550, FDA 21 CFR 177.2600, FDA 21 CFR 177.2415
– NSF H1
– EC 1935/2004
– EU 10/2011
– EC 2023/2006
– Free of animal-derived ingredients (ADI-free)
– EC 999/2001, revision 2015: TSE/BSE free
– Versions complying with EHEDG and 3-A regulations on request

Special features

- Proportional pressure regulators with cavity-free valve bodies made of stainless steel
- Wetted inside surfaces with a precision-lathed or polished finish
- Diaphragms monitored for leakage over a test connection

Versions

Excess pressure valve with diaphragm to control the inlet pressure to the adjusted set point

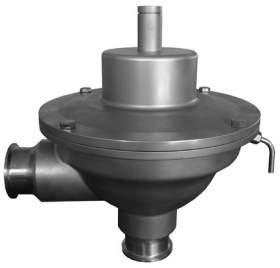
– **Type 2371-00** · Excess pressure valve with pneumatic set point adjustment
– **Type 2371-01** · Excess pressure valve with mechanical set point adjustment

Pressure reducing valve with diaphragm to control the outlet pressure to the set point adjusted by a spring

– **Type 2371-10** · Pressure reducing valve with pneumatic set point adjustment
– **Type 2371-11** · Pressure reducing valve with mechanical set point adjustment

Type 2371-00 Excess Pressure Valve with pneumatic set point adjustment

Type 2371-01 Excess Pressure Valve with mechanical set point adjustment and with stem locking



Type 2371-10 Pressure Reducing Valve

Pressure regulator		Types 2371-00/-01	Types 2371-10/-11
Function		Excess pressure valve	Pressure reducing valve
Valve size	DN	15 to 50	15 to 50 [2]
	NPS	½ to 2	½ to 2 [2]
Body material		1.4409, 1.4404/CF3M, 316L	
Maximum pressure		10 bar/150 psi	10 bar/150 psi
Set point ranges	bar	0.3 to 1.2 through 4 to 6	0.4 to 1.2 through 4 to 6
End connections	Flanges	•	•
	Welding ends	•	–
	Threaded ends	•	•
	Clamps	•	•
Leakage, based on K_{VS} coefficient		Metal seal: ≤0.05 % Soft seal: ≤0.01 %	
Medium temperature range		0 to 160 °C (32 to 320 °F)	
Max. sterilization temperature [1]		180 °C (356 °F) up to 30 min	
Cleaning	CIP	•	•
	SIP	•	•
Associated documentation		T 2642	T 2640

[1] Up to 30 minutes
[2] Type 3271-10 only in DN 32 to 50/NPS 1¼ to 2

Type 2371-11 Pressure Reducing Valve

Steam Conditioning

Type 7110 Water Bath Desuperheater

Type 3281 Steam Conditioning Valve

Type 7115 Spray Nozzle

Application

Temperature reduction with or without pressure control · Spray nozzles and steam conditioning valve for desuperheating steam to protect downstream systems and processes · Water bath cooler for the generation of saturated steam for highly precise temperature control of product-related processes

Versions

– **Type 7110** · Water bath desuperheater/saturated steam generator · Saturated steam generated from superheated steam · Compact unit with or without open-loop control · Temperature control für extremely sensitive production processes · Plant protection to safeguard against excess temperature also with SIL capability

Water bath desuperheater	**Type 7110**
Material	1.4541/P235GH (standard version) 1.4571/16Mo3 (special version)
Control range	0 to 100 %
Control accuracy	Max. ±0.1 K
Inlet pressure rating	Up to PN 40 (standard version) Up to PN 160 (standard version)
Saturated steam pressure	Up to 10 bar (standard version) Up to 40 bar (special version)
Saturated steam temperature	Up to 185 °C (standard version)
Steam flow rate	Up to 40 t/h with a saturated steam pressure of 10 bar
Associated documentation	T 3972

– **Type 3281** · Pneumatic steam conditioning valve (globe valve)

Type 3281 Steam Conditioning Valve	**DIN**		**ANSI**	
Body material **Cast steel**	**1.6019**	**1.7357**	**A216 WCC**	**A217 WC6**
Valve size	DN 50 to 300		NPS 2 to 12	
Pressure rating	PN 16 to 160		Class 150 to 900	
End connections	Flanges · Welding ends			
Seat/plug seal and leakage class	Metal seal: IV High-performance metal seal: V			
Characteristic	Equal percentage or linear			
Rangeability	50:1			
Temperature range	–10 to +220 °C		14. to 428 °F (–10 to +220 °C)	
With high-temperature packing	Up to 350 °C		Up to 660 °F (up to 350 °C)	
With insulating section	–10 to +400 °C	–10 to +500 °C	–20 to +800°F (–29 to +425 °C)	–20 to +932 °F (–29 to +500 °C)
Associated documentation	T 8251		T 8252	

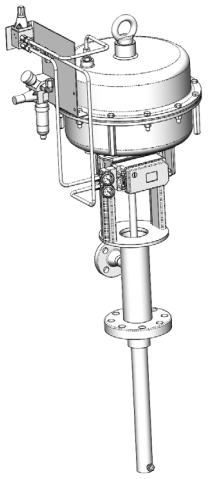
Type 7110 Water Bath Desuperheater

Type 3281 Steam Conditioning Valve with Type 3271 Pneumatic Actuator

– **Type 7115** · Spray nozzle

		Venturi-type nozzle	Fixed orifice nozzle	Spring-loaded nozzle	Variable nozzle with pneumatic actuator
Application		For low steam velocities	For a small control range	For a medium-sized control range	For a large control range
Max. temperature		570 °C (steam side)			
Nozzle version		Variable Cryogenic applications	Fixed	Spring-loaded control	Multiple nozzle controlled by an actuator
Fail-safe action		Fail-open, fail-close or fail-in-place			
Stroking speed		1 to 17 s [1]			<30 s
Pressure rating	DIN	≤PN 100 (PN 400)	≤PN 400		
Nominal size of steam line	Min.	DN 50	DN 100		DN 150
	Max.	DN 500	DN 1000		DN 600
Temperature sensor distance		5 to 10 m	10 to 15 m	10 to 20 m	10 to 20 m
Control valves		SAMSON water control valve with Type 3730 Positioner			Type 3271 Pneumatic Actuator with Type 3730 Positioner including Type 4708 Air Set
Accessories		SAMSON lock-up valve/volume booster/solenoid valve			
Associated documentation		T 3975			

[1] Depending on the actuator size



Type 7115 Spray Nozzle

Condensate Systems

Type 7140 Condensate Recovery System

Type 7141 Condensate Vessel

Type 7142 Flash Vessel

Application

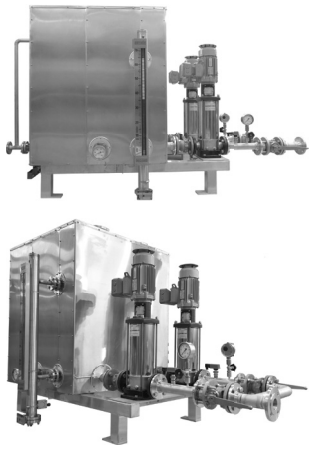
Temperature reduction with or without pressure control · Spray nozzles and steam conditioning valve for desuperheating steam to protect downstream systems and processes · Water bath cooler for the generation of saturated steam for highly precise temperature control of product-related processes

Versions

- **Type 7140-1** · Condensate vessel for condensate collection and storage · Associated documentation: T 3982
  - Flange connections in PN 16
  - Tank sizes in 350, 700, 1000 or 1500 l
  - Stainless steel
  - Excessive head up to 200 m · Delivery pressure up to 20 bar
  - With on-site level control without level indication
    Optionally on-site level control with level indication
  - Standard without insulation
    Optionally with 19 mm Armaflex insulation or 50-mm-thick mineral wool with aluminum jacket
  - One feed pump as standard
    Optionally with two feed pumps (redundant 2 x 100 %) and integrated pump switchover control
- **Type 7141** · Condensate vessel for condensate collection and storage · Associated documentation: T 3986

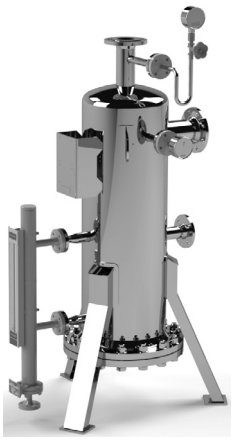
  Integrated connections:
  - Flanges PN 16 to 40
  - Material: stainless steel or non-alloy steel
  - Vessel designed as an open or pressurized tank
  - With pressure maintaining system to discharge flash steam through the roof
  - With liquid level measurement
  - Optionally with manhole
  - Combined with a Type 7111 Pump Assembly to create a functional unit (including control unit)
- **Type 7142** · Flash vessel · Associated documentation: T 3987

  Integrated connections:
  - Flanges PN 16 to 63
  - Material: stainless steel or non-alloy steel
  - Vessel designed as an open or pressurized tank
  - Optionally with monitoring of the filling level
  - Optionally with manhole
  - Optionally with constant pressure control of the flash steam and condensate (see Type 7150 Process Control System)



Type 7140-1 Condensate Recovery System in stainless steel, without insulation

Type 7141 Condensate Vessel



Type 7142 Flash Vessel

Temperature Sensors

Types 5207-61/-64 and -65 Fast-response Temperature Sensors

Application

Temperature sensors are used to measure the temperature.

Versions

– **Types 5207-61/-64 and -65** · Temperature sensors with short response times for measuring rapid temperature changes in heat exchangers

Type		5207-61	5207-64	5207-65
Resistor		Pt1000	Pt1000	Pt1000
Number of resistors		1	1	1
Immersion tube length	mm	110	170	250
Immersion depth	mm	80	40 to 120	120 to 190
Connecting cable length	mm	2500	2500	2500
Pressure rating		PN 40	PN 40	PN 40
Permissible temperature [°C]	Process medium	–50 to +180	–15 to +180	–15 to +180
	Ambient	–50 to +180	–15 to +180	–15 to +180
Associated documentation		T 5221	T 5221	T 5221

Type 5207-64 (top)/
Type 5207-61(bottom) Temperature Sensor

Pneumatic Actuators

Types 3271 and 3277 Pneumatic Actuators

Type 3379 Pneumatic Actuator

Types 3271 and 3277 Pneumatic Actuators

The actuators convert the control signal supplied by automation equipment (controller, control station, process control system) into a linear or rotary motion used to position the final control element (e.g. valve plug) corresponding to the control signal received.

The actuators can be equipped with accessories, such as positioners, converters, solenoid valves, pneumatic remote adjusters and/or limit switches, to adapt the pneumatic control valves to the requirements of the process plant.

See Information Sheet T 8350 for more details on the selection of accessories.

Special features

The pneumatic actuators are diaphragm actuators with rolling diaphragm and internal compression springs. They have the following benefits:

- Designed for signal pressures up to 6 bar (90 psi)
- Low overall height
- Powerful thrust and high stroking speed
- Minimum friction
- Various bench ranges (adapted to local conditions)
- No special tools required to change the bench range or reverse the direction of action

Fail-safe action

Depending on the version, the actuators have two different fail-safe actions which become effective when the pressure is relieved from the diaphragm or the air supply fails:

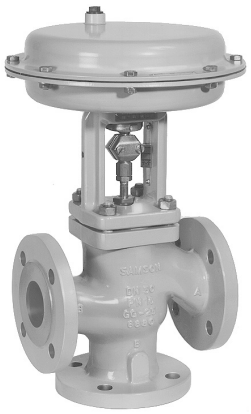
– **Actuator stem extends (FA):** the spring force moves the actuator stem to the lower end position.

– **Actuator stem retracts (FE):** the spring force causes the actuator stem to retract.

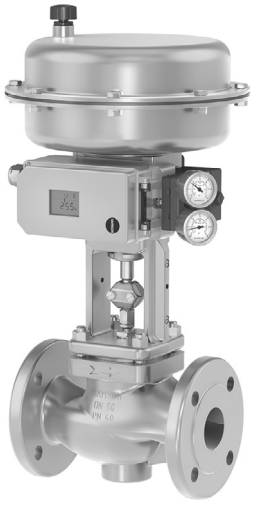
Versions

– **Type 3271** · Pneumatic actuator for 7.5 to 120 mm travel and actuator areas of 120 to 2 x 2800 cm². Optionally with handwheel.
  – Thrust range (120 to 150,000 N) depending on operating range
  – 175v2, 350v2, 355v2 or 750v2 cm² actuator areas [1] available as stainless steel version with full diaphragm
  – 240, 350 or 700 cm² actuator areas available as stainless steel version with clamped-in diaphragm
  – Associated documentation: T 8310-1, T 8310-2 and T 8310-3

– **Type 3277** · Pneumatic actuator for 7.5 to 30 mm travel and actuator areas of 120 to 750v2 cm². For integral positioner attachment, allowing the positioner to be attached completely protected in the yoke under the bottom diaphragm case. Optionally with handwheel.



Type 3271 Pneumatic Actuator



Type 3277 Pneumatic actuator for direct attachment of a positioner and limit switch

[1] **v2** is added to the actuator area (e.g. 175v2 cm²) to indicate actuators with a full diaphragm

– Thrust range (480 to 24,000 N) depending on operating range
– 175v2, 350v2, 355v2 or 750v2 cm² actuator areas [1] available as stainless steel version with full diaphragm
– 240, 350 or 700 cm² actuator areas available as stainless steel version with clamped-in diaphragm
– Associated documentation: T 8310-1

Type 3379 Pneumatic Actuator

The Type 3379 Pneumatic Actuator (with spring-return mechanism) is used in conjunction with a valve suitable for the food and pharmaceutical industries.

Special features

- Can be combined with Type 3347 Hygienic Valve or Type 3349 Aseptic Valve
- Smooth stainless steel surfaces for easy cleaning
- All moving parts located inside the housing to improve safety
- Visual indicator for the valve position
- Internal air routing to prevent air or water from entering the device

Type	**3379**					
Piston diameter	**63 mm**	**90 mm**		**150 mm**		
Actuator area	**31 cm²**	**63 cm²**		**176 cm²**		
Rated travel	15 mm	15 mm		15 mm		
Permissible ambient temperature	0 to +60 °C (32 to 140 °F)	0 to +60 °C (32 to 140 °F)		0 to +60 °C (32 to 140 °F)		
Max. supply pressure	8 bar	8 bar		8 bar		
"Actuator stem extends" fail-safe action (fail-close)						
Number of springs	1	1	2	3	4	6
Travel [mm]	15	15	15	15	15	15
Thrust [N]	710	1510	2330	1760	2280	3690
"Actuator stem retracts" fail-safe action (fail-open)						
Number of springs	1	1	2	3	3	–
Travel [mm]	15	15	15	15	15	–
Thrust [N]	680	1320	2580	2990	6500	–
Associated documentation	EB 8315					

Type 3379

Type 3379 with Type 3724 Positioner

[1] **v2** is added to the actuator area (e.g. 175v2 cm²) to indicate actuators with a full diaphragm

Positioners

Pneumatic/Electropneumatic, Analog and Digital Positioners

Ex
certified

Application

Positioners ensure a predetermined assignment of the valve position (controlled variable x) to the input signal (reference variable w). They compare the control signal issued by pneumatic or electric automation equipment (controller, control station, process control system) to the position or opening angle of the control valve and supply a corresponding output signal pressure (output variable y).

Versions

Pneumatic and electropneumatic positioners

– **Pneumatic positioners**
Pneumatic positioners accept an input signal of 0.2 to 1 bar (3 to 15 psi) and issue an output signal pressure (p_{st}) of maximum 6 bar (90 psi).

– **Electropneumatic positioners**
Electropneumatic positioners use an analog DC signal of 0/4 to 20 mA or 1 to 5 mA as the input variable and issue an output signal pressure (p_{st}) up to 6 bar (90 psi).

Analog positioners

–	**Type 3730-0**	·	Electropneumatic positioner	· T 8384-0
–	**Type 3766**	·	Pneumatic positioner	· T 8355
–	**Type 3767**	·	Electropneumatic positioner	· T 8355
–	**Type 4763**	·	Electropneumatic positioner	· T 8359
–	**Type 4765**	·	Pneumatic positioner	· T 8359

Digital positioners

SAMSON digital positioners are single-acting or double-acting positioners for attachment to pneumatic linear or rotary actuators. Due to their digital signal processing technology, these positioners have the following advantages over conventional positioners:

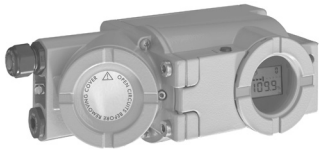
- Easy operation
- LCD with rotatable reading direction
- Automatic adjustment of zero and span during the initialization procedure
- Automatic error detection
- Direction of action independent of mounting position
- Zero monitoring
- Low air consumption
- All parameters saved in non-volatile EEPROM

TROVIS 3730-1,
Type 3730-x

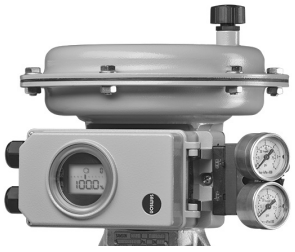
TROVIS 3730-3

TROVIS 3793

Type 3725



Type 3731-3



TROVIS 3730-1, direct attachment

–	**Type 3725**	·	Electropneumatic positioner	· T 8394
–	**Type 3730-1**	·	Electropneumatic positioner	· T 8384-1
–	**Type 3730-2**	·	Electropneumatic positioner	· T 8384-2
–	**Type 3730-3**	·	Electropneumatic positioner (HART®)	· T 8384-3
–	**Type 3730-4**	·	Electropneumatic positioner (PROFIBUS®-PA)	· T 8384-4
–	**Type 3730-5**	·	Electropneumatic positioner (FOUNDATION™ fieldbus)	· T 8384-5
–	**Type 3730-6**	·	Electropneumatic positioner (HART®)	· T 8384-6
–	**TROVIS 3730-1**	·	Electropneumatic positioner	· T 8484-1
–	**TROVIS 3730-3**	·	Smart positioner (HART®)	· T 8484-3
–	**TROVIS 3793**	·	Smart positioner (HART®)	· T 8493
–	**TROVIS 3797**	·	Smart positioner (PROFINET®)	· T 8497

Certain digital positioner models can be fitted with additional functions:

- Inductive limit switches
- Solenoid valve
- Position transmitter
- External position sensor
- Analog input
- Binary input and output
- Forced venting function
- Leakage sensor

The Type 3730-3, 3730-6, TROVIS 3730-3 and TROVIS 3793 Positioners allow HART® communication between the field and process control level. The Types 3730-4 and 3730-5 Positioners allow the integration of the final control elements into a PROFIBUS® PA and FOUNDATION™ fieldbus network respectively.

The Series 3793 Positioners expand the range of functions that Series 3730 Positioners have to offer. They have a modular design and generate a high air capacity. Variable outputs, e.g. double-acting control, can be achieved by using exchangeable pneumatic modules that can be retrofitted. Optional additional functions, such as limit contacts, position feedback or binary inputs and outputs, can be added to the TROVIS 3793 Positioner on site as option modules. This positioner uses HART® communication.

The TROVIS 3797 Positioner uses PROFINET® communication based on the Ethernet-APL (Advanced Physical Layer) technology to communicate with process control systems almost in real time.

Further features of TROVIS 3793 and TROVIS 3797 Positioners:

- Non-contact position sensing
- Plain-text display with NAMUR Recommendation NE 107 status messages on the device
- Simple one-knob, menu-driven operation
- Pressure sensors
- Integrated EXPERTplus valve diagnostics
- Simple attachment to all common linear and rotary actuators

TROVIS 3793

Series 3730-x

Series 3730,
attachment to Type 3241 Valve

TROVIS 3793,
attachment to Type 3241 Valve

Positioners

Electropneumatic positioner · Type 3724 combined with Type 3379 Pneumatic Actuator

Application

Single-acting positioner combined with Type 3379 Pneumatic Actuator. Self-calibrating, automatic adaptation to valve and actuator.

Special features

- Compact unit by combining it with Type 3379 Pneumatic Actuator
- Can be combined with Type 3347 Hygienic Valve, Type 3349 Aseptic Valve or Type 3321CT Globe Valve
- Smooth, robust stainless steel surfaces
- Valve position reading easy to read
- Internal air routing with automatic purging of the spring chamber
- Modified PID controller for high control accuracy
- Easy, intuitive operation using keys and an LCD
- Two software limit contacts

Version

– **Type 3724** · Electropneumatic positioner with on-site operation and LCD

Type	3724
Rated travel	4 to 16 mm, adjustable in steps of 0.5 mm
Reference variable	4 to 20 mA
Supply Air quality acc. to ISO 8573-1	Supply air: 1.4 to 7 bar (20 to 105 psi) Maximum particle size and density: Class 4, oil content: Class 3 Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Signal pressure (output)	0 bar up to the supply pressure minus 0.4 bar Can be limited to approx. 2.3 bar by software
Characteristic	Adjustable
Ambient temperature	–20 to +80 °C
Degree of protection	IP65 [1] (only applies in combination with Type 3379 Pneumatic Actuator)
Additional electrical equipment	
Limit contact	Two software limit contacts (min., max.), reverse polarity protection, galvanic isolation
Associated documentation	T 8395

[1] In preparation

Type 3724 (cover removed)

Type 3724 with Type 3379 Actuator

Valve Accessories

Application

Together with valve accessories, control valves serve as engineered solutions for special applications adapted to the requirements of industrial plants.

Electropneumatic converters

Electropneumatic converters accept a direct-current input signal from measuring and control equipment and convert it into a pneumatic output signal for measuring or control tasks. They are particularly suitable as intermediate element between electric measuring devices and pneumatic controllers or between electric control devices and pneumatic control valves.

- **Type 6111** · Electropneumatic converter · T 6111
- **Type 6126** · Electropneumatic converter · T 6126
- **Type 6116** · Electropneumatic converter · T 6116

Limit switches

Limit switches are fitted with two inductive, electric or pneumatic limit contacts, optionally with a solenoid valve. They issue a signal when an adjusted limit value is exceeded or not reached.

- **Type 4740** · Electric limit switch · T 8357
- **Type 4746** · Electric or pneumatic limit switch · T 8365
- **Type 3776** · Electric limit switch · T 3776

Solenoid valves

Solenoid valves convert binary signals issued by electric control equipment into binary pneumatic control signals.

See Solenoid Valves on page 38

Pneumatic lock-up valve

Pneumatic lock-up valves shut off the signal pressure line either when the air supply falls below an adjusted value or upon complete air supply failure. This causes the pneumatic actuator to remain in its last position.

- **Type 3709** · Pneumatic lock-up valve · T 8391

Remote adjuster

The pneumatic remote adjuster is a precision pressure regulator which can be adjusted manually.

- **Type 3759** · Pneumatic remote adjuster · T 8510

Supply pressure regulators

Supply pressure regulators provide pneumatic measuring and control equipment with a constant supply pressure. They reduce and regulate the air network pressure of maximum 12 bar (174 psi) to the pressure adjusted at the set point adjuster.

- **Type 4708** · Supply pressure regulator · T 8546

Type 6111

Type 6126

Type 4746

Type 3709

Type 4708

Service unit

The service unit is used to supply compressed air to pneumatic transmitters, controllers and positioners. It cleans the compressed air, removing any dirt particles, water and oil. In addition, it regulates the air pressure to a constant output pressure.

– **Type 3999-009X** · Service unit · T 3999-6

Filter regulator

The filter regulator is used to supply compressed air to pneumatic volume boosters for large actuators. It cleans the compressed air, removing any dirt particles, water and oil. In addition, it regulates the air pressure to a constant output pressure.

– **Type 3999-0096** · Filter regulator · T 3999-8

Instrument air tank

Instrument air tanks guarantee the supply of compressed air. Including shut-off valve, check valve or pneumatic lock-up valve at the supply air connection as well as pressure gauge, pressure switch for monitoring the supply pressure and safety valve for pressure safeguarding

Delivered as turnkey system

Air receiver tank/emergency air supply

As air receiver tank to compensate for pressure fluctuations in instrument air or as emergency air supply to supply pneumatic control equipment after the instrument air supply fails.

Versions

– Compressed air tanks ranging from 10 to 20 liters for direct mounting on the valve or horizontal or vertical compressed air tanks ranging from 20 to 750 liters
– Maximum 11 bar operating pressure
– Tanks made of steel with painted or primed exterior and corrosion-protected interior (stainless steel also available)
– Connections with threaded fittings or flanges
– Pressure vessel approval according to 2014/68/EU (European Pressure Equipment Directive) or ASME approval
– Supply air inlet fitted with check valve or pneumatic lock-up valve A shut-off valve can also be fitted on request.
– Optionally with pressure gauge, pressure switch for monitoring the pressure or safety valve for emergency pressure relief
– Other versions on request

– **Type 7510** · Air receiver tank/emergency air supply · T 3974

Type 3999-009X

Type 3999-0096

Type 7510

Solenoid Valves

Type 3969, Type 3967 and Type 3963 Solenoid Valves

Application

Solenoid valves are the interfaces between the electric control level and the pneumatic actuator. Due to their minimal power consumption, they can even be actuated using intrinsically safe fieldbus systems.

The solenoid valves are subjected to high quality demands and various versions are certified for safety-instrumented systems according to IEC 61508.

Different switching functions, flow rates and connection types allow the solenoid valve to be tailor-made for the specific task.

The solenoid valves are used to control pneumatic actuators. In addition to direct attachment to linear actuators according to IEC 60534-6 (NAMUR) and rotary actuators according to VDI/VDE 3845 or 3847, the solenoid valves can be mounted on rails or walls with customized hook-up to all types of actuators.

Versions

- **Type 3963** · Solenoid valve in type of protection intrinsic safety Ex ia · Without air consumption
- **Type 3967** · Solenoid valve with integrated air purging of the spring chamber in type of protection intrinsic safety Ex ia or non-sparking equipment Ex na
- **Type 3963** · Solenoid valve in type of protection intrinsic safety Ex ia or non-sparking equipment Ex na

Solenoid valve	Type 3969	Type 3967	Type 3963
Nominal signal	14 to 24 V DC	6, 12, 24 V DC	6, 12, 24 V DC or 24, 48, 115, 230 V AC
Power consumption	<71 mW	6 to 27 mW	6 to 27 mW or 0.17 to 0.46 VA
Air consumption	No air consumption	≤80 l/h [1] (in idle position), ≤25 l/h [1] (in operating position)	≤80 l/h [1] (in idle position), ≤10 l/h [1] (in operating position)
Switching function			
3/2-way function	•	•	•
5/2-way function		•	•
5/3-way function		•	•
6/2-way function			•
K_{VS} coefficient	0.32 to 4.3	0.32 to 4.3	0.16 to 4.3
Degree of protection	IP65	IP65	IP54 or IP65
Ambient temperature	−45 to +80 °C	−45 to +80 °C	−45 to +80 °C
Associated documentation	T 3969	T 3967	T 3963

[1] With 1.4 bar supply

Type 3969 Solenoid Valve

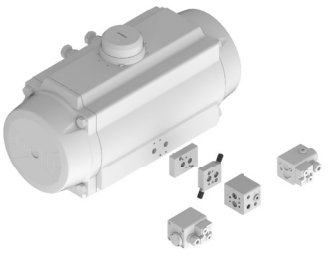
Type 3967 Solenoid Valve

Type 3963 Solenoid Valve

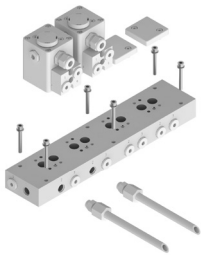
Solenoid valve accessories

The accessories for SAMSON solenoid valves are designed according to the modular principle. Such accessories include various adapter plates, double-axial adapters and restrictor plates as well as special constructions. They allow the solenoid valves to be adapted to meet a wide variety of requirements.

Accessories	
Adapter plates	Distance plate with NAMUR interface ¼
	Distance plate with NAMUR interface ½
	Sealing plate with extended NAMUR interface ¼
	Adapter plate for NAMUR interface ¼ on NAMUR rib ½
	Adapter plate for NAMUR interface ½ on NAMUR rib ¼
	Adapter plate for extended NAMUR interface ¼ with external threaded connections
	Adapter plate for NAMUR interface ½ on threaded connection ½
	Adapter plate with extended NAMUR interface ¼ on NAMUR rib
	Adapter plate with NAMUR interface ¼ on NAMUR rib
	Adapter plate with NAMUR interface ½ on NAMUR rib
	Adapter plate with NAMUR interface ½ on NAMUR rib with additional connections
Double-axial adapters	Double-axial adapter 180° with extended NAMUR interface ¼
	Double-axial adapter 90° with extended NAMUR interface ¼
	Double-axial adapter 90° with NAMUR interface ½
	Double-axial adapter 90° with NAMUR interface ½ with additional connections
Restrictor plates	Exhaust air restrictor with extended NAMUR interface ¼
	Supply air restrictor with extended NAMUR interface ¼
	Double exhaust air restrictor with extended NAMUR interface ¼
	Universal restrictor with extended NAMUR interface ¼
Special constructions	Emergency air supply, NAMUR interface ¼ – 2oo2
	Emergency venting, NAMUR interface ¼ – 1oo2
	Emergency venting, extended NAMUR interface ¼ – 1oo2
	Emergency air supply, NAMUR interface ½ – 2oo2
	Emergency venting, NAMUR interface ½ – 1oo2
	Adapter plate for four extended NAMUR interfaces ¼ on threaded connection ¼
	Adapter plate (closed-circuit principle)
Application notes	AB 11

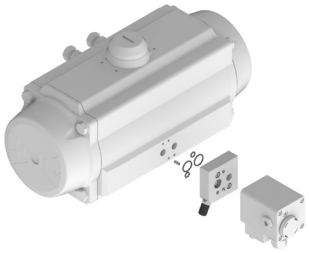


Solenoid valve accessories

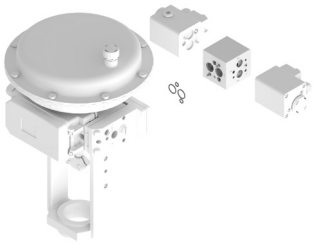


Adapter plate: four extended NAMUR interfaces ¼ on threaded connection ¼

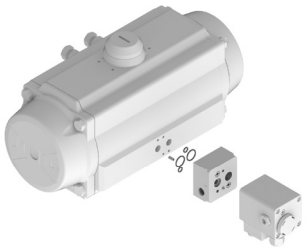
Adapter plate: extended NAMUR interface on NAMUR rib



Exhaust air restrictor: extended NAMUR interface



Redundancy block: emergency venting, extended NAMUR interface ¼ – 1oo2



Adapter plate: extended NAMUR interface with external threaded connections

Measuring and Control Station

Type 7400 Measuring and Control Station

Application

For use in simple control applications with one or two control loops in combination with control valves by SAMSON Group companies.

Versions

– **Type 7400** · Measuring and control station

Special features:

- Ready-to-connect equipment
- Contains a TROVIS 6495/TROVIS 6493 Industrial Controller
- For one or two control loops
- Ready-wired for temperature or pressure control
- 24 V or 230 V version
- Installation directly in the plant
- No external set point required
- Set point input possible
- On-site installation for shorter cables
- Customized switching cabinets/special versions on request

Type	Material no.	Industrial controller	Analog inputs	Analog outputs	Voltage supply	Control (default setting)
7400-01	100147091	1x TROVIS 6493	2x AI [4 to 20 mA]	1x AO [4 to 20 mA]	90 to 230 V AC	One control circuit [fixed set point control for pressure]
7400-02	100147092	1x TROVIS 6495		2x AO [4 to 20 mA]		2 control loops [fixed set point control for pressure]
7400-03	100147093	2x TROVIS 6493				
7400-04	100147094	1x TROVIS 6493		1x AO [4 to 20 mA]	24 V AC/DC	One control circuit [fixed set point control for pressure]
7400-05	100147095	1x TROVIS 6495		2x AO [4 to 20 mA]		2 control loops [fixed set point control for pressure]
7400-06	100147096	2x TROVIS 6493				
7400-11	100173614	1x TROVIS 6493	2x AI [Pt100/ Pt1000]	1x AO [4 to 20 mA]	90 to 230 V AC	One control circuit [fixed set point control for temperature]
7400-12	100173616	1x TROVIS 6495		2x AO [4 to 20 mA]		2 control loops [fixed set point control for temperature]
7400-13	100173617	2x TROVIS 6493				
7400-14	100173618	1x TROVIS 6493		1x AO [4 to 20 mA]	24 V AC/DC	One control circuit [fixed set point control for temperature]
7400-15	100173619	1x TROVIS 6495		2x AO [4 to 20 mA]		2 control loops [fixed set point control for temperature]
7400-16	100173770	2x TROVIS 6493				
7400-99	100173771	Customized configuration in TROVIS 6493 or TROVIS 6495				
Associated documentation: T 3990/T 6495/T 6493						

Type 7400 Measuring and Control Station

Electric Steam Generators and On-site Steam Generation

Type 7121 Mobile Electric Steam Generator (90 kW)

Type 7120 Industrial Electric Steam Generator (300 kW)

Type 7129 Industrial Electric Steam Generator (1 MW)

Application

Types 7120 and 7129 Electric Steam Generators are suitable for industrial applications. They are designed for steam generation directly on site and can be used to set up on-site steam networks for steam pressures up to 10 bar.

The Type 7121 Electric Steam Generator with its rating up to 90 kW and 5 bar(a) is ideal for small-scale steam generation (e.g. for disinfection, laboratories, cleaning applications etc.).

The electric steam generator offers the following benefits:

- Very little installation work required (no fuel supply or exhaust system required, less pipework)
- On-site network structure: less heat loss generated since electric cables are used in place of a pipeline.
- Lower cost to generate steam especially in cases where a photovoltaic installation is used to generate electricity.
- No emissions produced on site

Type 7121 Electric Steam Generator with Type 7126 Feedwater System and Type 7123 Movable Base

Versions

- **Type 7121** · Electric steam generator (90 kW) as a mobile unit for flexible steam generation at any location

  The Type 7121 Electric Steam Generator fitted with the Type 7125 Blowdown Vessel and Type 7126 Feedwater System is designed for industrial use and is ideally suited for flexible small-scale steam generation. The Type 7123 Movable Base is used to facilitate transportation of the compact unit.

Rating kW	15	30	45	60	75	90
Steam output kg/h	20.4	40.8	61.2	81.6	102	122.4
Max. operating gauge pressure	5 bar					
Max. operating temperature	158 °C					
Voltage	400 V · 50 Hz					
Current A	23.4	43.2	64.8	86.4	108	130
Dimensions (LxWxH) mm	1050x450x650					
Approx. weight kg	80					
Accessories	Type 7126 Feedwater System · Type 7125 Blowdown Vessel · Type 7123 Movable Base					
Associated documentation	T 3977; T 3980; T 3979; T 3978					

- **Type 7120** and **Type 7129**· Electric Steam Generators (300 kW and 1 MW) for the generation of small to medium steam output as stationary units

  In comparison with conventional steam generators, fully electric steam generators are better suited to meet a varying steam demand in processes due to the fast start-up and flexible control of steam temperature and output. Furthermore, electric steam generators have a much higher efficiency.

The Type 7128 Boiler Room allows the use of up to three electric steam generators in combination with the following cost-effective, ready-to-use accessories:

– Type 7127 Boiler Feedwater System
– Type 7124 Blowdown Vessel

or

– Water treatment

Electric steam generators	**Type 7120**	**Type 7129**
Rating	300 kW Other ratings on request	1 MW
Operating pressure (steam generator)	11 bar(a)	
Design pressure (boiler)	12 bar(a) Operating pressure 1 bar below the design pressure Special boilers for higher pressures on request	
Permissible operating temperature	–10 to 184 °C	
Rated volume	90.2 l	Approx. 100 l
Voltage	400 V, three phase, 50 Hz	690 V, three phase, 50 Hz
Amperage	435 A	836 A
Steam output	400 kg/h	1300 kg/h
Materials Boiler	Stainless steel	
Design basis	DIN EN 12953, DIN EN 14222, DIN EN 12952, PED 2014/68/EU	–
Weight of boiler unit	300 kg	Approx. 350 kg
Accessories	Type 7127 Feedwater System · Type 7124 Blowdown Vessel · Type 7128 Boiler Room	
Associated documentation	T 3976	–

Annex

Abbreviations and terms as well as European and US organizations and standards

3-A conformity
Confirmation that 3-A standards have been observed.

3-A Sanitary Standards Inc.
An independent, not-for-profit US corporation dedicated to advancing hygienic equipment design for the food, beverage and pharmaceutical industries. Similar to FDA, their specifications are internationally observed.

3-A sanitary class
Classification of resistance properties of seal materials, e.g. EPDM. Tests include changes in volume and hardness under different pressure and temperature conditions and depending on the medium.

ANSI – American National Standards Institute
Creates engineering standards for the United States.

Aseptic design
Equipment is designed to meet specifications for sterile applications and for products, such as pharmaceuticals.

Aseptic process
Processes include production of chemical-pharmaceutical active substances (sterile BPC), biopharmaceutical substances, pharmaceutics, pure water and steam systems, biochemistry, genetic engineering.

ASME – American Society of Mechanical Engineers
Creates consensus standards for mechanical engineering.

ASME-BPE – American Society of Mechanical Engineering – Bioprocessing Equipment
Specifications for plant components, such as pipes and fittings, whose wetted surfaces must be polished to meet hygienic regulations concerning surface finish.

ASTM – American Society for Testing and Materials
Creates consensus standards for material quality and material quality testing methods.

BN II – Basler Norm II (guidelines of the Swiss chemical and pharmaceutical industries)
According to this standard, stainless steels with very low ferrite content, e.g. 1.4435, are tested and defined to achieve the best possible corrosion resistance.

BPC – Bulk Pharmaceutical Chemicals
White biotechnology substances with an annual output of more than 10,000 tonnes. Such substances include amino acids, biopolymers, vitamins, solvents and antibiotics.

BPEC – Bio Processing Equipment Committee
A sub-committee of ASME. It creates engineering standards for the design, specification, manufacture and documentation of equipment used for biopharmaceutical processes.

BS – British Standard
Creates engineering standards for the United Kingdom.

CEN – Comite Européen de Normalisation
Committee for European Standardization. Creates standards that reflect the best practices in each industry (except for electrical engineering and telecommunications). Currently supports 30 member states.

CFR – Code of Federal Regulation
Codification of the general and permanent rules of the US federal government. It is divided into 50 titles that represent broad areas subject to federal regulation. Each volume of the CFR is updated once each calendar year and is issued on a quarterly basis.

cGMP – Current Good Manufacturing Practices
Current design and operating practices developed by the pharmaceutical industry to meet FDA requirements as published in the Code of Federal Regulations.

CIP – Clean in Place
The technique of cleaning process line components using liquid cleaning agents without the need for relocation or disassembly.

CS/PS – Clean steam/Pure steam
Cleaning and sterilization using clean steam or pure steam.

PED – Pressure Equipment Directive 2014/68/EU
European directive for the design, manufacture and conformity assessment of pressure equipment with a maximum permissible pressure greater than 0.5 bar

DIN – German Institute for Standardization
Creates engineering standards for Germany and is a contributing body to CEN and ISO.

DIW – DI water – Deionized water
Fully demineralized water through deionization.

DVGW – Deutsche Vereinigung des Gas- und Wasserfachs
The German Technical and Scientific Association for Gas and Water establishes technical standards for the safe and reliable supply of gas and water.

EHEDG – European Hygienic Engineering and Design Group
The group's objective is to provide standardization organizations (CEN and ISO) with specialist views on hygienic and aseptic design by publishing requirements and test methods.

EP – European Pharmacopoeia
European counterpart to USP. Private, not-for-profit corporation for creating standards for the medical industry.

Abbreviations and terms as well as European and US organizations and standards

EP or E/P – Electropolish

Electrochemical polishing process for metal components where metal ions are removed from the surface of the metal.

EPA – Environmental Protection Agency

US governmental organization for protection of the environment and health.

EPDM – Ethylene propylene diene rubber

An elastomer used for primarily for seals due to its mechanical, thermal and chemical resistance. It is not resistant to mineral oil products.

FDA – Food and Drug Administration

Enforcement agency of the US Government for food, drug and cosmetics manufacturing. Author of the US cGMPs. Responsible for new product approvals, plant inspections and product recalls. Even though the authority's scope is limited to the US, these regulations are used on an international basis.

FDA CFR – Code of Federal Regulations

Title 21 CFR Part 11 of the Code of Federal Regulations deals with the Food and Drug Administration (FDA) guidelines on electronic records and electronic signatures in the United States.

GAMP – Good Automated Manufacturing Practice

The guide describes a set of principles and procedures that help ensure that pharmaceutical products have the required quality.

GMP – Good Manufacturing Practice

Practices conforming with requirements stipulated by ISO, EN, DIN, FDA, WHO etc.

GMP media – Pure media

Media that are produced in accordance of the standards of the GMP guidelines.

Hygienic procedure

Procedure to keep hygiene standards, minimizing hygienic risks, e.g. in the food processing and pharmaceutical industries.

IQ – Installation Qualification

Verifies that the equipment and its ancillary systems or subsystems have been installed in accordance with installation drawings and/or specifications.

ISO – International Standards Organization

ISO is a network of the national standards institutes with a Central Secretariat in Geneva, Switzerland, that coordinates the system.

ISPE – International Society for Pharmaceutical Engineering

Society for improving and researching production standards for the pharmaceutical industry.

KTW – Kunststoffe im Trinkwasserbereich (German guideline for the hygienic assessment of organic materials in contact with drinking water)

Recommendations for plastics and elastomers made by the German Federal Environment Agency (BGA).

MTR – Certified Mill Test Report or Material Test Report

Traceability material analysis. Similar to the inspection certificate according to EN 10204.

NPDWR – National Primary Drinking Water Regulations

US regulations for public drinking water supply systems that include health-based standards for various contaminants and monitoring and analysis requirements.

OQ – Operation Qualification

Establishes that process equipment and subsystems are capable of consistently operating within established limits and tolerances. Operational Qualification should follow on from the Installation Qualification (IQ).

Oral medication

Pharmaceutical products taken orally.

P&ID – Piping and Instrumentation Diagram

P&ID is a schematic illustration of functional relationship of piping, instrumentation and system equipment components.

Parenterals

Pharmaceutical products by injection.

POU – Point of Use

A valve outlet in a recirculation utility system (typically a water system).

PQ – Performance Qualification

The demonstration and documentation that the various units and procedures of a process operate as they should.

PS – Pure steam

Pure steam produced by steam generators in the food processing and pharmaceutical industries.

PTFE – Polytetrafluoroethylene

Material used for seals and linings with excellent anti-adhesive properties and an almost universal chemical resistance.

PW – Purified water

Ingredient water (not for injection) or rinse water for pharmaceutical products conforming to USP.

Abbreviations and terms as well as European and US organizations and standards

Sanitary design

Design of equipment to meet specifications for hygienic applications, e.g. in the beverage industry.

SIP – Sterilize-(steam)-in-place

Sanitization of process line components by the use of steam without the need for relocation or disassembly.

TFM™PTFE

The modified PTFE has an improved surface, a wider temperature range, chemical resistance and weldability.

TOC – Total Oxidizable Carbon or Total Organic Carbon

A measure of the amount of organic compounds in a water sample. Carbon is oxidized and the level of CO2 is measured. The proposed USP water standards are based on TOC analysis.

Traceability

Traceability of production process and the assignment of measurements to specimens, e.g. inspection certificate 3.1 – EN 10204-3.1.

TrinkwV (TVO) – German Drinking Water Ordinance

Rules and limit values for the quality for portable water. It is based on an EU directive.

USP – United States Pharmacopoeia

A private, non-profit organization that sets standards for drugs, drug ingredients, medical devices and diagnostics. The FDA enforces the established standards.

USP Class I to VI certification

Tests classified by the FDA performed on medical applications. Six classes are defined. The most tests are performed in Class VI.

Validation

Establishing by objective evidence that a process consistently produces a result meeting its predetermined requirements.

WfI – Water for injections

Water for use as a solvent for the preparation of parenteral products conforming to USP guidelines.

SAMSON AT A GLANCE

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- Asia 600
- Americas 200
- Frankfurt am Main, Germany 1,900

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- Pharmaceuticals and biotechnology
- Oil and gas
- Liquefied Natural Gas (LNG)
- Marine equipment
- Power and energy
- Industrial gases
- Cryogenic applications
- District energy and building automation
- Metallurgy and mining
- Pulp and paper
- Water technology
- Other industries

PRODUCTS

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- Self-operated regulators
- Actuators
- Positioners and valve accessories
- Signal converters
- Controllers and automation systems
- Sensors and thermostats
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- More than 200 representatives

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- SAMSON India, Pune district, established in 1999
  Total plot and production area: 28,000 m²
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  Total plot and production area: 27,000 m²
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  Total plot and production area: 1,100 m²
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  Total plot and production area: 19,000 m²
- SAMSON SED, Bad Rappenau, Germany
  Total plot and production area: 10,400 m²
- SAMSON STARLINE, Bergamo, Italy
  Total plot and production area: 27,000 m²
- SAMSON VDH PRODUCTS, the Netherlands
  Total plot and production area: 12,000 m²
- SAMSON VETEC, Speyer, Germany
  Total plot and production area: 27,100 m²

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